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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/778,144	02/07/2001	Thomas Hodge	A33942; 070337.0237	8595

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EXAMINER

HU, HENRY S

ART UNIT	PAPER NUMBER
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1713

DATE MAILED: 07/31/2002

6

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	Applicant(s)	
09/778,144	HODGE, THOMAS	
Examiner	Art Unit	
Henry S. Hu	1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 13-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☒ Claim(s) 13-24 are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 February 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

(a) On page 1, the title of the invention is missing. From MPEP, the content of specification requires the title should follow:

Title of the Invention: See 37 CFR 1.72(a) and MPEP § 606. The title of the invention should be placed at the top of the first page of the specification unless the title is provided in an application data sheet. The title of the invention should be brief but technically accurate and descriptive preferably from two to seven words may not contain more than 500 characters.

(b) On page 10, line 13, the full name of recitations of “BET” and “CTAB” should be described one time in the specification. It is also applicants’ obligation to describe the methodology of these two measurements in detail.

(c) On page 20, line 2, a typing error on France patent specification FR-A-2 740 778. The comma mark “,” should be inserted between 740 and 778, also inserted between 2 and 740.

(d) On page 22, line 39, a big typing error on the recitation “a 50/5 0 weight ratio”. Is it 50/50 or 50/5.0?

(e) On page 23, line 13 of Table 3, a typing error on the recitation “(1000 km”. It is needed to change to “(1000 km)”.

Appropriate corrections for (a) and (e) are required.

Election/Restrictions

2. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-12, drawn to a cross-linked rubber composition for the tread of a heavy-vehicle tire, classified in class 524, subclass 262.

II. Claims 13-24, drawn to a process of making a rubber composition for the tread of a heavy-vehicle tire, classified in class 524, subclass 492.

3. Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case Group II is not limited to prepare the composition used by Group I, or even to use the filler specified in Group I. The only requirement is that the components mixing in Group II need to be compatible, therefore the process of Group II does not always produce the composition useful in Group I.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

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4. During a telephone conversation with Rochelle K. Seide on July 3, 2002 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-12. Affirmation of this election for Group I, claims 1-12 must be made by applicant in replying to this Office action. Claims 13-24 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

6. Claims 1-6, 8 and 10-11 are rejected under 35 U.S.C. 102(e) as being anticipated by Araki et al. (US 6,177,503).

The present invention relates to a heavy-vehicle tire comprising a tread which is formed from a cross-linked rubber composition, the composition comprising: (a) An elastomeric matrix comprising a diene elastomer having one or more of its chain ends a function group which is active for coupling to a reinforcing white filler. (b) A reinforced filler comprising a reinforced white filler in at least 50 wt% of total filler. (c) A bonding agent for polymer and white filler.

The diene polymer is a copolymer (T_g -70 to -20 °C, 10-50 wt%) of a conjugated diene and a vinyl-aromatic compound. The functional group on the diene polymer is silanol, a polysiloxane having a silanol end, or an alkoxysilane group. White filler is a silica (20-80 phr) having CTAB 80-260 m²/g. The coupling agent is a polysulphurized alkoxysilane. The white filler may be covered by an alkoxysilane.

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7. Regarding the limitations of Claims 1-3, 6, 8 and 11, Araki et al. disclose a rubber composition for the tread of tire (column 13, line 7-8), and the composition comprising: (a) A diene based rubber including a diene copolymer (Tg -60 °C or higher) of 1,3-butadiene and styrene (15-30 wt%), and the copolymer has been treated by coupling at chain ends with a coupling agent (column 5, line 54-column 6, line 60). (b) A silica filler (20-100 phr of rubber) (abstract, line 16, column 6, line 61 to column 7, line 9) is used with carbon black (0-100 phr of rubber). (c) A specific silane coupling agent such as bis(alkoxysilylalkyl) polysulfide (column 7, line 32-56).

8. Regarding Claims 4 and 5, Araki et al. disclose that the copolymer has been treated by coupling at chain ends with a coupling agent containing silicon such as silicon tetrachloride or a coupling agent containing alkoxysilane (column 5, line 54-column 6, line 60). Since end group with silicon chloride or alkoxysilane when hydrolyzed is equivalent to end group with silanol for sol-gel condensation, thereby, Claims 4 and 5 are anticipated over Araki et al. Therefore, the limitations of Claims 1-6, 8 and 10-11 are anticipated by Araki et al.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Araki et al. (US 6,177,503) as applied to claims 1 and 6 above, and further in view of Agostini et al (US 5,674,932).

10. Regarding Claims 7 and 10, Araki et al. use silica filler but are silent on the CTAB value of silica. Araki et al. further disclose that the various silica used in the disclosure are not limited to the examples mentioned from column 6, line 61 to column 7, line 8. The difference between the disclosure of Araki et al. and the present invention is that Araki et al.'s silence on the CTAB value of silica.

Araki et al. and Agostini et al. are analogous art since they are both involving rubber composition with silica filler.

11. Since Araki et al. genetically disclose various silica are used and Agostini et al. specifically teach the silica may be expected to have a CTAB surface area in a range of about 100 to about 220 (column 14, line19-21). Therefore, one of the ordinary skill in the art would expect the silica disclosed by Agostini et al. will function properly as a filler in Araki et al.'s composition because one of the ordinary skill in the art would expect all the species of a known genus to work satisfactorily.

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Claims 9 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Araki et al. (US 6,177,503) as applied to claim 1 above, and further in view of Loiselle (US 5,989,719).

Regarding Claims 9 and 12, Araki et al. disclose that the various silica used in the disclosure are not limited to the examples mentioned from column 6, line 61 to column 7, line 8. The difference between the disclosure of Araki et al. and the present invention is that Araki et al.'s silence on the use of alkyl alkoxysilane-modified silica.

12. Araki et al. disclose the diene based polymers which are modified in the chain ends with coupling agent such as dialkyldialkoxysilanes, monoalkyltrialkoxysilanes, or monoalkyltriaryloxysilanes, will improve processability and have a large affinity with silica (column 6, line 42-60). Loiselle teaches a heat curable liquid silicone rubber composition comprising vinyl-containing polydiorganosiloxane and organohydrogensiloxane, will improve hydrocarbon oil resistance. Therefore, by using Araki's disclosure on modified diene based polymer to modify the silica with the same alkylalkoxysilanes, thereby will improve the affinity with the Araki's modified diene based polymer and will result a oil-resistant final product.

Araki et al. and Loiselle are analogous art since they are both involving rubber composition with silica filler.

13. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the cross-linked rubber composition disclosed by Araki et al. with an

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alkylalkoxysilane-modified silica using the same alkylalkoxysilanes which are used to modify Araki's diene based polymer, thereby to improve the affinity and processability between the polymer and silica, and to obtain better oil-resistance as taught by Loisel, in order to obtain the claimed composition useful as a cross-linked rubber composition for the tread of a tire for bearing heavy loads and thereby obtain the present invention.

14. Claims 1-6, 8-9 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahmud et al. (US 6,028,137) in view of Araki et al. (US 6,177,503) and Cabioch et al. (US 6,013,718).

The present invention relates to a heavy-vehicle tire comprising a tread which is formed from a cross-linked rubber composition, the composition comprising: (a) An elastomeric matrix comprising a diene elastomer having one or more of its chain ends a function group which is active for coupling to a reinforcing white filler. (b) A reinforced filler comprising a reinforced white filler in at least 50 wt% of total filler. (c) A bonding agent for polymer and white filler.

The diene polymer is a copolymer (T_g -70 to -20 °C, 10-50 wt%) of a conjugated diene and a vinyl-aromatic compound. The functional group on the diene polymer is silanol, a polysiloxane having a silanol end, or an alkoxysilane group. White filler is a silica (20-80 phr) having CTAB 80-260 m^2/g . The coupling agent is a polysulphurized alkoxysilane. The white filler may be covered by an alkoxysilane.

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15. Regarding Claims 1-3, Mahmud et al. disclose elastomeric compounds comprising (a) an elastomer. (b) a silicon-treated carbon black. (c) optionally carbon black, silica, and carbon black having an organic group attached. and (d) optionally a coupling agent (abstract, line 1-3). The elastomer used by Mahmud et al. may include a mixture of polymers and copolymers of conjugated dienes such as butadiene, isoprene, chloroprene, and its copolymer with styrene and methyl styrene, and natural rubber (column 13, line 8-13, column 30, line 66-column 31, line 5, column 29, line 40-52). The Tg of polymers are preferably in the range of -120°C to about 0°C (column 12, line 58-61). Copolymer of styrene (10-70 wt%) and butadiene (90-30 wt%) is used (column 13, line 1-4).

16. Regarding Claims 6, 9, 11-12, Mahmud et al. disclose the composition may include carbon black and silica treated carbon black, silica such as silica, precipitated silica, amorphous silica, fumed silica (column 12, line 26-42) and others which are equivalent to the claimed subject matters on the carbon black and silica. The silicon-treated carbon black contains 0.1-25 % silicon (column 30, line 42-44). Mahmud et al. is silence on the wt % of silicon-treated carbon black.

17. Regarding the Claim 9, Mahmud et al use the silica treated carbon black modifying by alkylsilane of $\text{X}_n\text{-Si-R}_{4-n}$ $n=1-3$ X=alkoxy of 1-3C , R=alkyl of 1-18 , Mahmud et al. disclose in example 1 and 3A that octamethylcyclotetrasiloxane (OMTS) may be mixed with tetraethoxysilane (TEOS) to modify surface of carbon black following the reaction conditions such as temperature required to make N234 black (column 19, line 3-4), thereby the same silanol group with hydrophobic alkyl property is obtained (column 16-ex 1 and 18-ex 3A).

Regarding 8, the bonding agent used by Mahmud et al. is a bis(alkoxysilylalkyl) polysulfide (column 32, line 14-15).

18. The difference between the disclosure of Mahmud et al. and the present invention is that Mahmud et al. do not use a chain end-modified diene polymer with end group of silanol. Araki et al. teach the diene copolymer can be modified at chain ends with a coupling agent containing silicon such as silicon tetrachloride or a coupling agent containing alkoxysilane (column 5, line 54-column 6, line 60) to get better affinity with silica (column 6, line 55-60). Cabioch et al. teach a procedure to modify the chain ends of diene-based polymer with silanol or a polysiloxane having a silanol end, the advantage is to reduce the hysteresis on the tread of the tire (abstract). Therefore, it would have been obvious to one of the ordinary skill in the art at the time the invention was made to prepare a rubber composition for tire and tread using the composition disclosed by Mahmud et al. but with silanol or polysiloxane silanol chain-end modified diene-based polymer as taught by Araki et al. and Cabioch et al. for a better affinity with silica filler and a lower hysteresis on the tread of the tire in order to obtain the claimed composition useful for a better tire and tread for bearing heavy loads and thereby obtain the present invention.

19. Claims 7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahmud et al. (US 6,028,137) as applied to claims 1 and 6 above, and further in view of Agostini et al. (US 5,674,932).

Regarding Claims 7 and 10, Mahmud et al. disclose the composition may include carbon black and silica treated carbon black, silica such as silica, precipitated silica, amorphous silica, fumed silica (column 12, line 26-42) and others which are equivalent to the claimed subject matters on the carbon black and silica. The difference between the disclosure of Mahmud et al. and the present invention is that Mahmud et al.'s silence on the CTAB value of silica.

Mahmud et al. and Agostini et al. are analogous art since they are both involving rubber composition with silica filler.

20. Since Mahmud et al. genetically disclose various silica are used and Agostini et al. specifically teach the silica may be expected to have a CTAB surface area in a range of about 100 to about 220 (column 14, line 19-21). Therefore, one of the ordinary skill in the art would expect the silica disclosed by Agostini et al. will function properly as a filler in Mahmud et al.'s composition because one of the ordinary skill in the art would expect all the species of a known genus to work satisfactorily.

Conclusion

21. The prior art made of record and not relied upon is considered pertinent to applicants' disclosure.

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Materne et al. (US 6,156,822) disclose that the preparation of an elastomer containing diene-based polymer with end group, carbon black and the silica treated carbon black, and the organosilane including bis-(trimethoxysilylpropyl) disulfide as coupling agent, however, Materne et al. have to prepare a dispersion of filler reinforcement formed in-situ with organic solvent (column 15, example 1).

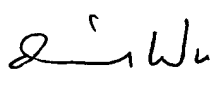
22. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Henry S. Hu whose telephone number is (703) 305-4918.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (703) 308-2450.

Any inquiry of general nature or relating to the status of this application or proceeding should be directed to the group receptionist whose telephone number is (703) 308-2351.


Henry S. Hu

July 29, 2002


DAVID W. WU
SUPERVISORY PATENT EXAMINER
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